REMARKS

Claims 1-17 are pending in this application.

Claims 1-17 are rejected

The office action dated July 31, 2006 indicates that claims 1-17 are rejected under 35 USC §112, second paragraph, as being indefinite because the term “state of the digital printing” in claims 1, 4, 9 and 11 is unclear. The office action argues that state could mean “status” of the printing press or “state parameter” of the printing press.

This rejection is respectfully traversed. The office action attempts to isolate the term “state of the digital printing” and interpret the term in isolation. However, this is improper.

The office action has no reasonable basis to interpret “state” as “status.” Claims 1, 4, 9 and 11 recite “an ink thickness control parameter based on current and past measurements of a state of the digital printing press.” The specification does not disclose that “status” of the printing press” is measured. However, the specification does describe the state in terms of at least one state parameter. See, for example, paragraph 30 of the specification which describes the “state” of the digital printing press in terms of a set of parameters. Since the office action does not offer a reasonable basis for its dual interpretation of “an ink thickness control parameter based on current and past measurements of a state of the digital printing press,” the ‘112 rejection should be withdrawn. Nevertheless, claim 1 has been amended for clarity, and claims 4, 5 and 9 have been amended to depend properly from amended claim 1.

The office action further rejects claims 8, 11, 15 and 16 rejected under 35 USC §112, second paragraph, as being indefinite. The office action rejects claim

11 because it lacks antecedent basis for “the printing apparatus” in line 5. The ‘112 rejection is traversed because the body of claim 11 makes it clear that the apparatus performs printing (a print engine is recited). Nevertheless claim 11 has been amended for clarity. Claim 11 has been further amended to correct a typographical error.

The office action rejects claims 8 and 16, alleging that they lack antecedent basis for “the estimated developer voltage.” The ‘112 rejection is respectfully traversed, since their base claims recite that an ink thickness control parameter is estimated, and the specification makes it clear that developer voltage is one such parameter. Nevertheless, claims 8 and 16 have been amended for clarity.

The office action rejects claim 15, alleging it lacks antecedent basis for “the state parameters” This rejection is respectfully traversed because “different state parameters” in line 2 provides antecedent basis for “the state parameters” in line 3. Nevertheless, claim 15 has been amended for clarity.

The office action indicates that claims 1-10, 13 and 17 contain allowable subject matter and would be allowed if the ‘112 rejections are overcome.

The office action also indicates that claims 11, 12 and 14-16 are rejected under 35 USC §102(b) as being anticipated by Seymour U.S. Patent No. 5,967,049. The ‘102 rejection is respectfully traversed.

Seymour discloses a mechanical printing press that includes an ink fountain roller 40 and a segmented blade 42 disposed along the outer surface of the roller 40 (col. 1, lines 24-27; and col. 4, lines 64-67). The amount and thickness of ink supplied to the fountain roller 40 is adjusted by changing the spacing between the edge 46 of each blade segment 44 and the outer surface of the roller (col. 1, lines 28-31; and col. 5, lines 12-15).

Seymour's printing press further includes an ink key control system 70 having ink keys 54 that adjust the position of the segmented blade to control the amount of ink fed to a vertical strip of a print medium (col. 1, lines 39-41; and col. 5, lines 15-25). Positions of the ink keys 54 are moved by bi-directional motors 58 (col. 5, lines 27-28). Potentiometers 60 generate signals that indicate the ink key positions (col. 5, lines 34-39). The potentiometers also indicate the positions of the blade segments 44 (col. 6, lines 24-27).

A processing unit 68 receives information about plate coverage on line 72 (col. 5, lines 50-53). The plate coverage data can be provided by an optical plate scanner (col. 5, lines 53-54). The processing unit also receives a potentiometer signal on line 64 (col. 5, lines 39-42). The processing unit 68 generates a signal on line 66, which is sent to the bi-directional motor 58. The signal on line 66 is used to position the ink keys (col. 5, lines 43-44).

Seymour describes several models that are used to generate the ink key position signal on line 66. A first model is described in equations 1, 2 and 3. Actual ink key opening (P) is modeled as a linear function of ink key value and a measured gain (equation 1). Film thickness (T_b) on the fountain roller is modeled as a linear function of the ink key opening (P) and an ink-dependent constant (equation 2). Ink film thickness supplied to a ductor roller is modeled as a linear function of the fountain roller ink thickness (T_b), an ink-related constant, and a ratchet setting (equation 3). The ratchet setting controls the amount of fountain roller rotation during each stroke (col. 6, lines 13-15).

A second model is described in equations (4) to (8). In these equations, plate coverage is modeled as a function of measured plate coverage (c), a constant k (col. 7, lines 35-39), and ink film thickness (tn) on a surface Sn. Constant K is an ink split ratio between two rollers. Equations (4) to (8) demonstrate that both ink film thickness (t_{29}) at the web surface and relative ink

utilization factor (E) can be modeled as a linear function of measured plate coverage (c). These two linear functions are given as equations 9 and 10. The relative ink utilization provides a measure of the ink thickness at the ductor roller that is needed to obtain a desired ink thickness on the web (col. 9, lines 23-28).

The second model does not account for lateral movement of vibration rollers (col. 10, lines 65-67). Seymour proposes an ink key distribution function that can be convolved with the ink key openings to determine the percentage of ink transferred to neighboring zones (col. 11, lines 1-11). The distribution function is determined by measuring optical density of ink key zones of printed images (col. 11, lines 42-43). Measured density data is corrected for the effects of ink saturation and plate coverage (col. 12, lines 16-17).

Equation 14 relates ink film thickness (T_i) on the ductor roller to ink film thickness (L_i) presented to the plate cylinder (col. 13, lines 3-19). The equation (14) utilizes V, which is a vector representing the ink key distribution function.

Equation 18 rewrites equation 14 in terms of matrix multiplication (col. 14, lines 19-21), and equation 19 rewrites equation 18 to solve for T, which is the ink film thickness on the ductor roller (col. 14, lines 38-39).

Equation 21 results from combining equations 1, 2 and 3 (col. 16, lines 1-2). Ink film thickness (T_i) on the ductor roller is a function of G, which can be determined by taking empirical measurements of images on the web at known key settings (col. 16, lines 6-25).

Equation 24 is used to compute the ink key openings. The ink key openings are computed as a function of ink film thickness (T_i), the constant G, and another constant R. The ink film thickness (T_i) is determined from optical density measurements of printed images. The constant G is also determined by taking measurements of printed images. The constant R is an optimal ratchet

setting. It is not measured. Thus, Seymour computes the ink key openings from measurements of printed images. The ink key openings are not computed from measurements of the state of the printing press.

Claim 11 recites apparatus comprising a print engine for depositing ink at a thickness that is determined at least in part by a control parameter; and a processor for estimating the control parameter by applying an estimation model to measured state parameters of the apparatus.

Seymour does not teach or suggest applying his model to measured state parameters of the printing press. Seymour applies his model to measurements of printed images.

For these reasons, Seymour does not teach or suggest the apparatus of claim 11. Therefore, claim 11 and its dependent claims 12 and 14-16 should be allowed over Seymour.

In the '102 rejection of claim 11, the office action argues that L is a parameter that controls ink thickness. However, the arguments is not supported by Seymour. Col. 13, lines 34-36 of Seymour states that L <u>is</u> ink film thickness on an imaged area of a printing plate on the plate cylinder at the i^{th} ink key zone.

Claim 12 should be allowed for the additional reason that it recites a digital printing press and also recites developer voltage as a control parameter for the digital printing press. In contrast, Seymour discloses a mechanical printing press that deposits ink at a thickness that depends on ink key positions. The office action alleges that the potentiometer 60 generates a developer voltage. It does not. The potentiometer indicates the position of ink keys (col. 5, lines 34-39).

The office action indicates that claims 18-27 are pending. However, claims 18-27 were cancelled by examiner's amendment subsequent to a telecon with

applicants' attorney Denise Lee on April 18, 2006. There is no indication that these claims were restored. Therefore, only claims 1-17 are pending.

Claims 28-36 have been added to the application. These new claims correspond to the cancelled claims (except for claim 18), which were withdrawn from consideration due to a restriction requirement. However, these new claims are dependent claims. Therefore, restriction of the new claims should not be required. No additional fee has been incurred by the addition of claims 28-36.

The examiner is respectfully requested to withdraw the rejections of the claims. The examiner is encouraged to contact applicant's attorney Hugh Gortler to discuss any issues that might remain.

Respectfully submitted,

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